PATENT ABSTRACTS OF JAPAN

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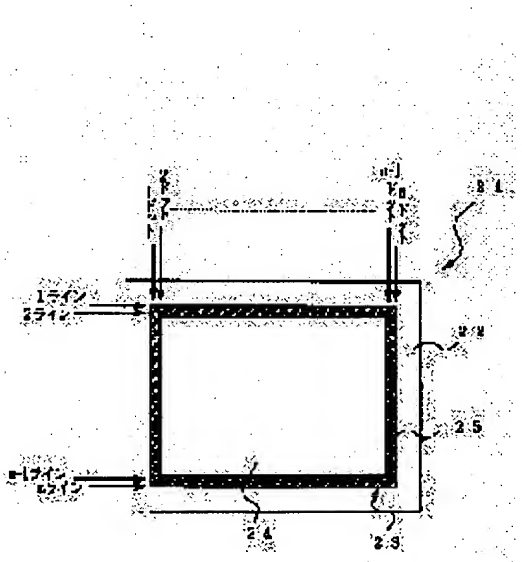
(54) LIQUID CRYSTAL DISPLAY DRIVING METHOD

(57)Abstract:

PURPOSE: To obtain a proper liquid crystal display device in which the leakage of light from a backlight is can be avoided only by controlling a liquid crystal driving signal.

CONSTITUTION: A liquid crystal display panel 21 is constituted of an inactive area 22 and a view area 23 when it is seen from the direction of a display surface and in the view area, moreover, a picture display part 24 displaying pictures and a light shielding part 25 driving liquid crystal so that the inside peripheral part of the view area 23 become a light shielding state with a prescribed width are formed. The light shielding part 25 is formed by outputting selectively the liquid crystal driving signal while using a data enabling signal. Further, in addition to this, the light shielding part 25 is formed by storing preliminarily selection signals determinining whether display data are outputted as they are or not and whether a non-display driving signal driving liquid crystal to the light shielding state is selected or not in an ROM or an RAM while making the selection signals correspond with respective pixel positions and by outputting the driving signal to the liquid crystal display panel 21 while selecting either of driving signals at the time of driving liquid crystal. Consequently, light of the backlight can be prevented from leaking from a display surface side.



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NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] Form the pixel which has arranged the counterelectrode for a liquid crystal drive to the opposed face of the transparence substrate of a pair, and the liquid crystal cell which closed the periphery section between the transparence substrates of said pair with the sealing agent is filled up with liquid crystal. It is the liquid crystal display drive approach which impresses a predetermined electrical potential difference to the liquid crystal for every pixel for said counterelectrode by the signal side mechanical component and the scan side mechanical component, and forms and carries out image display of a light transmission condition and the protection-from-light condition while irradiating light from the single-sided field of said transparence substrate. The liquid crystal display drive approach characterized by driving liquid crystal so that it may be in a protection-from-light condition during image display at least about the pixel of the predetermined field of the periphery section of said transparence substrate.
[Claim 2] It is the liquid crystal display drive approach according to claim 1 of driving so that it may be in a protection-from-light condition at least during image display about the liquid crystal of the pixel which the pixel of the predetermined field of the periphery section of said transparence substrate consists of a pixel for several dots each of the upper limit section of a liquid crystal display field, a part for each of several lines of the lower limit section and the left end section of a liquid crystal display field, and the right end section, and is in those fields.
[Claim 3] It is the liquid crystal display drive approach according to claim 2 characterized by enabling it to change each value of the vertical edge of the protection-from-light field which drives liquid crystal according to the size of the viewing area of said liquid crystal cell so that a predetermined field may be in a protection-from-light condition, and a right-and-left edge at least during image display.
[Claim 4] The liquid crystal display drive approach given in any from claim 1 characterized by forming a protection-from-light condition with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives said counterelectrode, and a scan side mechanical component, respectively in case the liquid crystal of the pixel in said predetermined field is driven to claim 3 they are.
[Claim 5] The liquid crystal display drive approach given in any from claim 1 characterized by to choose whether priority is given to a driving signal based on the selection signal beforehand memorized corresponding to each pixel location in the indicative data outputted to the signal side mechanical component which drives said counterelectrode in case the liquid crystal of the pixel in said predetermined field is driven, or priority is given to a non-display signal, and to drive liquid crystal based on the selection result to claim 3 they are.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the liquid crystal display drive approach of driving the liquid crystal of a liquid crystal display panel, making a light transmission condition and a protection-from-light condition, and performing image display, irradiating light with a back light.
[0002]
[Description of the Prior Art] If the optical activity of the liquid crystal to which the polarization direction of light is changed is conventionally used, for example from the orientation of a liquid crystal molecule changing and the optical property of liquid crystal changing, if a liquid crystal display impresses a predetermined electrical potential difference to liquid crystal, light will penetrate the light irradiated by two polarizing plates from one side on both sides of a liquid crystal cell depending on how to combine the polarization direction of two polarizing plates, or it will be shaded. Moreover, although the array of a liquid crystal molecule becomes random and it will be in the condition that light is scattered about and light does not penetrate if an electrical potential difference is impressed to liquid crystal when using the light-scattering effectiveness of liquid crystal, a light transmission condition is acquired in the condition of not impressing an electrical potential difference to liquid crystal.
[0003] Drawing 11 is the sectional view of the liquid crystal display panel 1 using the optical property of the above-mentioned liquid crystal, and drawing 12 is the front view of the liquid crystal display panel 1 which looked at drawing 11 R> 1 from the screen side.
[0004] As shown in drawing 11 , the liquid crystal display panel 1 applies and closes a sealing agent 4 in the periphery section between the upper glass substrate 2 and the bottom glass substrate 3, and constitutes the liquid crystal cell which pours in liquid crystal. And two or more arrangement of the common electrode 6 is carried out at the shape of a stripe at the longitudinal direction of drawing in the direction which intersects perpendicularly with the above-mentioned segment electrode 5 at the opposed face side of the bottom glass substrate 3 at it while two or more arrangement of the segment electrode 5 is carried out in the depth direction of drawing to the opposed face of the upper glass substrate 2 at the shape of a stripe.
[0005] Here, the liquid crystal display panel of drawing 11 is an electrochromatic display display panel, and since the intersection parts of the above-mentioned segment electrode 5 and the common electrode 6 constitute the pixel, the color filter (R, G, B) is formed in each pixel location. And this liquid crystal display panel 1 consists of polarizing plates 8 and 9 on both sides of the vertical glass substrates 2 and 3 in order to make the transparency condition and protection-from-light condition of light using the optical activity of the above-mentioned liquid crystal.
[0006] And the white light of the back light irradiated from the lower part of drawing 11 controls the orientation of a liquid crystal molecule by the liquid crystal driving signal impressed to the above-mentioned segment electrode 5 and the common electrode 6 for every pixel, and is performing the desired electrochromatic display display according to the transmitted light condition and the protection-from-light condition.

[0007]
[Problem(s) to be Solved by the Invention] However, if it is in such a conventional liquid crystal display drive approach, it is divided into the view area 11 which performs the liquid crystal display into which the segment electrode 5 and the common electrode 6 were arranged, and liquid crystal was poured, and the inactive area 10 where it consists of sealing agent 4 grades, and liquid crystal is not poured in as shown in drawing 11 . And if a back light is irradiated from under a liquid crystal display panel, in the inactive area 10 without liquid crystal, light will penetrate as it is and transparency/protection-from-light condition of light will be repeated in the view area 11 where liquid crystal was poured in according to the drive conditions of liquid crystal.
[0008] For this reason, although the film in which the black mask for covering light was formed on the inactive area 10 of the polarizing plate 8 by the side of the upper glass substrate 2 of drawing 11 was arranged in the former From the light which passes through the inactive area 10 reflecting irregularly in the sealing agent 4 neighborhood The inactive area 10 cannot be covered with a black mask, and light cannot be completely covered only by the wrap, but there is a problem that the light of a back light leaks from between the inactive area 10 and the view area 11 which are shown in drawing 12 .
[0009] Moreover, a wrap sacrifice aperture may be prepared conventionally, applying the above-mentioned inactive area 10 with a black mask to the inactive area 10 to a part of view area 11 in addition to a wrap. However, since the area to cover is being fixed, this sacrifice aperture has the problem that a display rectangle becomes narrow depending on the contents of a display.
[0010] This invention is made in view of the above-mentioned technical problem, and aims at offering the liquid crystal display drive approach that the proper display which does not have the leakage of the light from a back light only by operating a liquid crystal driving signal simply is obtained.
[0011]
[Means for Solving the Problem] Invention according to claim 1 forms the pixel which has arranged the counterelectrode for a liquid crystal drive to the opposed face of the transparence substrate of a pair, and the liquid crystal cell which closed the periphery section between the transparence substrates of said pair with the sealing agent is filled up with liquid crystal. It is the liquid crystal display drive approach which impresses a predetermined electrical potential difference to the liquid crystal for every pixel for said counterelectrode by the signal side mechanical component and the scan side mechanical component, and forms and carries out image display of a light transmission condition and the protection-from-light condition while irradiating light from the single-sided field of said transparence substrate. The above-mentioned purpose is attained by driving liquid crystal so that it may be in a protection-from-light condition during image display at least about the pixel of the predetermined field of the periphery section of said transparence substrate.
[0012] Moreover, in this invention, the pixel of the predetermined field of the periphery section of said transparence substrate may consist of a pixel for several dots each of the upper limit section of a liquid crystal display field, a part for each of several lines of the lower limit section and the left end section of a liquid crystal display field, and the right end section so that may be indicated by claim 2, and at least during image display, the liquid crystal of the pixel in those fields may be driven so that it may be in a protection-from-light condition.
[0013] Furthermore, you may make it change at least each value of the vertical edge of the protection-from-light field which drives liquid crystal according to the size of the viewing area of said liquid crystal cell so that a predetermined field may be in a protection-from-light condition, and a right-and-left edge during image display so that this invention may be indicated by claim 3.
[0014] Moreover, in case this invention drives the liquid crystal of the pixel in said predetermined field so that it may be indicated by claim 4, you may make it form a protection-from-light condition with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives said counterelectrode, and a scan side mechanical component, respectively.
[0015] Moreover, in case this invention drives the liquid crystal of the pixel in said predetermined field so that it may be indicated by claim 5, it chooses whether priority is given to a driving signal based on

the selection signal beforehand memorized corresponding to each pixel location in the indicative data outputted to the signal side mechanical component which drives said counterelectrode, or priority is given to a non-display signal, and you may make it drive liquid crystal based on the selection result.
[0016]
[Function] By the liquid crystal display drive approach according to claim 1, liquid crystal is driven so that it may be in a protection-from-light condition during image display at least about the pixel of the predetermined field of the periphery section of a transparence substrate. Therefore, since the back light light by which scattered reflection is carried out near the sealing agent of the inactive area where liquid crystal is not poured in makes the predetermined field pixel of the periphery section of a transparence substrate a protection-from-light condition during image display at least, it can prevent that light leaks from a liquid crystal display side.
[0017] By the liquid crystal display drive approach according to claim 2, the pixel of the predetermined field of the periphery section of a transparence substrate consists of a pixel for several dots each of the upper limit section of a liquid crystal display field, a part for each of several lines of the lower limit section and the left end section of a liquid crystal display field, and the right end section, and the liquid crystal of the pixel in those fields is driven so that it may be in a protection-from-light condition.
[0018] Therefore, in the vertical edge of a liquid crystal display field, while driving two or more lines in the protection-from-light condition, in the right-and-left edge of a liquid crystal display field, it can prevent that back light light leaks by making the pixel of the predetermined field near the inside of a sealing agent into a protection-from-light condition by driving several dots of the beginning of level Rhine, and the last in the protection-from-light condition.
[0019] By the liquid crystal display drive approach according to claim 3, the value of the vertical edge of the protection-from-light field which drives liquid crystal according to the size of the viewing area of a liquid crystal cell so that a predetermined field may be in a protection-from-light condition, and a right-and-left edge is changed, respectively.
[0020] Therefore, since the range of the predetermined field made into a protection-from-light condition during image display at least is changed by the drive of liquid crystal, it becomes possible to change a protection-from-light field suitably according to the contents of a display, or the leakage condition of back light light, and the always optimal display condition can be acquired.
[0021] By the liquid crystal display drive approach according to claim 4, in case the liquid crystal of the pixel in a predetermined field is driven, a protection-from-light condition is formed with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives a counterelectrode, and a scan side mechanical component, respectively.
[0022] Therefore, since a protection-from-light field is formed using the enable signal which chooses whether the driving signal of liquid crystal is outputted, the timing which forms the range and protection-from-light field of the protection-from-light field is freely [easily and] controllable.
[0023] By the liquid crystal display drive approach according to claim 5, in case the liquid crystal of the pixel in a predetermined field is driven, it chooses whether priority is given to a driving signal based on the selection signal beforehand memorized corresponding to each pixel location in the indicative data outputted to the signal side mechanical component which drives a counterelectrode, or priority is given to a non-display signal, and liquid crystal is driven based on the selection result.
[0024] Therefore, the selection signal corresponding to each pixel location is held in memory, such as ROM and RAM, and since it chooses whether a selection signal is read from here and the driving signal is indicated by priority, or priority is given to a non-display signal and it changes into a protection-from-light condition and liquid crystal is driven, range, timing, etc. of a field which shade are freely [easily and] controllable.
[0025]
[Example] Hereafter, this invention is concretely explained based on an example. Drawing 1 - drawing 10 are drawings explaining the liquid crystal display drive approach of this invention, and are carried out by this example as a passive-matrix liquid crystal display using STN (Super Twisted Nematic) liquid

crystal. Drawing 1 is the front view of the display of the liquid crystal display panel 21 displayed by the liquid crystal display drive approach of this example. If the liquid crystal display panel 21 of drawing 1 is seen from the screen, it consists of inactive area 22 and view area 23, and if image display is carried out using the liquid crystal display drive approach of this example, the inside of the above-mentioned view area 23 will be divided into the protection-from-light section 25 which changes the liquid crystal drive of the image display section 24 and the inside periphery section of the view area 23 which display an image further into a protection-from-light condition by predetermined width of face.

[0026] It is for preventing that the white light of a back light penetrates this sealing agent, or scattered reflection of having formed the protection-from-light section 25 by the liquid crystal drive approach is carried out with a sealing agent, and it leaks to a screen side since the inactive area 22 of the liquid crystal display panel 21 consists of sealing agents which close an up-and-down glass substrate first and liquid crystal is not poured in like this example. That is, since the above-mentioned inactive area 22 cannot usually cover the light which leaks a liquid crystal display panel from the boundary line of the inactive area 22 and the view area 23 although the leakage of light can be prevented by a wrap panel etc., the pixel of the inside periphery section of the view area 23 is made to drive as a protection-from-light condition at least during image display, and it prevents that light leaks.

[0027] As shown in drawing 1 R> 1, in this example, the upper limit section of the view area 23 and the lower limit section the above-mentioned protection-from-light section 25, respectively Two lines (one line, two lines, m-1 line, m lines) It constitutes from field width of face of the left end section and a right edge which is 2 dots (1 dot, 2 dots, n-1 dot, n dots), respectively, and at least during image display, a display drive is carried out so that it may be in a protection-from-light condition.

[0028] Drawing 2 is the block diagram showing the configuration of the liquid crystal television 31 with which the liquid crystal display panel 21 of drawing 1 was incorporated. This liquid crystal television 31 consists of an antenna 32, a tuner 33, a receiving circuit 34, a synchronous circuit 35, the A/D-conversion circuit 36, a controller 37, a signal side drive circuit 38, a scan side drive circuit 39, etc.

[0029] An antenna 32 supplies a received electric wave to a tuner 33, and a tuner 33 chooses an assignment channel according to the tuning control signal which is inputted from a controller 37 and which is not illustrated, changes into an intermediate frequency signal the received electric wave supplied from an antenna 32, and it outputs it to a receiving circuit 34.

[0030] A receiving circuit 34 is constituted by an intermediate frequency amplifying circuit, an image detector circuit, an image amplifying circuit, the chroma circuit, etc., performs image detection for the intermediate frequency signal inputted from a tuner 33 by the image detector circuit, takes out a color video signal, outputs it to the voice circuit which does not take out and illustrate a sound signal out of this color video signal, amplifies a color video signal by the image amplifying circuit, and outputs it to a chroma circuit. A chroma circuit separates each color video signal of R, G, and B from a color video signal, and outputs it to the A/D-conversion circuit 36.

[0031] A synchronous circuit 35 takes out Horizontal Synchronizing signal Hsync and Vertical Synchronizing signal Vsync out of a color video signal, and outputs them to a controller 35.

[0032] Although the A/D-conversion circuit 36 is not illustrated, it consists of a sampling circuit, a comparator circuit, and an encoder circuit. After sampling the analog signal of R, G, and B functionally and carrying out A/D conversion (being the range of RHH-RLL division into equal parts) with a comparator, it changes into the digital display signal of a triplet in an encoder circuit.

[0033] A controller 37 is what controls actuation of the whole liquid crystal television 31. It is based on a Horizontal Synchronizing signal (Hsync) and a Vertical Synchronizing signal (Vsync). For example, make image display perform on the liquid crystal display panel 21, or The sampling clock which is not illustrated in the A/D-conversion circuit 36 is generated and supplied, or the internal basic clocks CK1 and CK2 with two phases which determine the reading timing of liquid crystal drive data and the output timing of data are generated, and the signal side drive circuit 38 is supplied. Moreover, the controller 37 of this example contains the circuit which creates the data enabling H signal to which a status signal is made to output alternatively based on a Horizontal Synchronizing signal, and the circuit which creates the data enabling V signal to which scan data are made to output alternatively based on a Vertical

Synchronizing signal.
[0034] This Vertical Synchronizing signal consists of the CNB signal which carries out the sequential shift of the CFB signal which is a scan reversal signal for carrying out the alternating current drive of the CDB signal and liquid crystal which determine the selection width of face of scan electrode scan initiation timing and a scan electrode for every frame, and said CDB signal in the scan side drive circuit 23.
[0035] Moreover, the Horizontal Synchronizing signal consists of the CKN signal which outputs the status signal which latched the status signal to the signal electrode and was stored in the signal side drive circuit 38 to the liquid crystal display panel 21, the CKF signal for carrying out the alternating current drive of the STi signal and liquid crystal which carry out sampling initiation of the status signal for every frame, and CK1 and CK2 signal which is a basic clock signal of the signal side drive circuit 38.
[0036] The liquid crystal display panel 21 is what was carried out here using the liquid crystal cell which enclosed STN LCD, and the signal electrode and scan electrode which become the opposed face of two transparence substrates which consisted of glass plates from ITO are arranged in the rectangular direction, respectively.
[0037] The signal side drive circuit 38 outputs alternatively the status signal which the data enabling H signal created by the controller 37 is inputted, and is inputted from the A/D-conversion circuit 36 described above with this data enabling H signal, and drives the predetermined signal electrode of the liquid crystal display panel 24.
[0038] The data enabling V signal created by the controller 37 is inputted, and the scan side drive circuit 39 outputs alternatively the scan signal generated with this data enabling V signal, and drives the scan electrode of predetermined Rhine of the liquid crystal display panel 24 while it generates a scan signal.
[0039] Thus, by outputting a status signal and a scan signal alternatively using data enabling [of a horizontal direction and a perpendicular direction / H], and data enabling [V], the liquid crystal display drive approach of this example can drive liquid crystal so that the pixel of the predetermined field of a liquid crystal display panel may be made into a protection-from-light condition and the other field may be made into the viewing area of image data. Here, as shown in drawing 1 , the protection-from-light section 25 which makes a pixel a protection-from-light condition obtains a proper display image as field width of face for 2 dots by [of the upper limit section of the view area 23, and the lower limit section] covering the white light of the back light of two lines, and the left end section and the right end section which leaks from the boundary line of the inactive area 22 and the view area 23, respectively.
[0040] Drawing 3 is a circuit diagram of the data enabling generating circuit 41 of a horizontal direction and a perpendicular direction built in the controller 37 of drawing 2 . In drawing 3 , the circuit of an upper case is the data enabling H generating circuit 42 which generates horizontal data enabling [H], and the circuit of the lower berth is the data enabling V generating circuit 43 which generates vertical data enabling [V].
[0041] The data enabling H generating circuit 42 inputs into one side of each input terminal of two NAND gates 46 and 47 the set pulse and reset pulse which are outputted from the n bit counter 44 according to the number of n signal electrodes, the decoder 45 which decodes the counted value, and a decoder 45, connects each output of two NAND gates 46 and 47 to another input terminal of the gate of another side, and is constituted. And a basic clock is counted based on the Horizontal Synchronizing signal inputted into the n bit counter 44, the counted value is decoded by the decoder 45, the set pulse and reset pulse which are outputted to predetermined timing are created, and it outputs to NAND gates 46 and 47.
[0042] Moreover, the data enabling V generating circuit 43 inputs into one side of each input terminal of two NAND gates 50 and 51 the set pulse and reset pulse which are outputted from the m bit counter 48 according to the number of M scan electrodes, the decoder 49 which decodes the counted value, and a decoder 49, connects each output of two NAND gates 50 and 51 to another input terminal of the gate of another side, and is constituted. And a basic clock is counted based on the Vertical Synchronizing signal inputted into the m bit counter 48, the counted value is decoded by the decoder 49, the set pulse and reset pulse which are outputted to predetermined timing are created, and it outputs to NAND gates 50

and 51.
[0043] Drawing 4 is a timing chart of a set pulse, a reset pulse, and a data enable signal which makes it generate by the data enabling generating circuit of drawing 3 . An enable signal is generated by operations sequence with same above-mentioned data enabling H generating circuit 42 and above-mentioned data enabling V generating circuit 43. Here, the data enabling H generating circuit 42 is mentioned as an example, and is explained.
[0044] That is, to the timing of A of drawing 4 , "H" of a set pulse and a reset pulse is inputted into one input terminal of NAND gates 46 and 47, respectively. Although the input terminal of another side of NAND gate 46 is indefinite in "L" and "H" at this time, since the input terminal of another side of NAND gate 47 and the output terminal of NAND gate 46 are connected and it is set to "L", the output of NAND gate 47 is set to "H." Therefore, data enabling [to which NAND gate 46 is outputted since "H-H" is inputted consequently / H] is set to "L."
[0045] Next, to the timing of B of drawing 4 , since a set pulse is set to "L", "L-H" is inputted, consequently, as for the input terminal of NAND gate 46, "H" is outputted. And since the "H" is inputted into the input terminal of another side of NAND gate 47, the input of NAND gate 47 serves as "H-H", and "L" is outputted. Therefore, since "L" is inputted into the input terminal of another side of NAND gate 46, "L-L" will be inputted and data enabling [which is outputted / H] is set to "H."
[0046] Next, to the timing of C of drawing 4 , since a set pulse returns to "H", "H-L" is inputted, consequently, as for the input terminal of NAND gate 46, "H" is outputted from NAND gate 46. And since the "H" is inputted into the input terminal of another side of NAND gate 47, the input of NAND gate 47 serves as "H-H", and "L" is outputted. Therefore, since "L" is inputted into the input terminal of another side of NAND gate 46, data enabling [which "H-L" is inputted, consequently is outputted from NAND gate 46 / H] is still "H."
[0047] Next, to the timing of D of drawing 4 , since a reset pulse is set to "L", "H-L" is inputted, consequently, as for the input terminal of NAND gate 47, "H" is outputted from NAND gate 47. And since the "H" is inputted into the input terminal of another side of NAND gate 46, the input of NAND gate 46 serves as "H-H", and it changes the output of the data enabling [H] to "L."
[0048] Next, to the timing of E of drawing 4 , since a reset pulse is set to "H", "L-H" is inputted, consequently, as for the input terminal of NAND gate 47, "H" is outputted from NAND gate 47. And since the "H" is inputted into the input terminal of another side of NAND gate 46, the input of NAND gate 46 serves as "H-H", and the output of the data enabling [H] is still "L."
[0049] Horizontal and the data enable signal of a proper in a perpendicular direction can be outputted as mentioned above, respectively from the data enabling H generating circuit 42 and the data enabling V generating circuit 43. It chooses whether this data enable signal outputs the status signal in a horizontal direction, and the scan signal in a perpendicular direction, respectively, and the liquid crystal drive based on image data is not performed, but the pixel part which does not output a liquid crystal driving signal will be in a protection-from-light condition.
[0050] The liquid crystal display panel currently used for the liquid crystal television of this example will be in the dark condition it is made not to keep covering light when the effective voltage impressed to a pixel is below a predetermined value, in order to carry out negative inverse video, and when the effective voltage conversely impressed to a pixel is beyond a predetermined value, it will be in the bright state which makes the white light of a back light penetrate.
[0051] Drawing 5 is the timing chart of the various signals and input data which are inputted into the signal side drive circuit 38 of drawing 2 . The data enabling H signal created as mentioned above chooses the output of the status signal of 1H period (1 horizontal-scanning period) from the data 1 equivalent to each horizontal pixel to Data n. In order to make 2 dots each of the left end section of a display screen, and the right end section into the protection-from-light section 25, it is made to output even data 3 - data n-2 here except for data 1, data 2, data n-1, and Data n. Moreover, in drawing 5 , STi is the data sampling start signal of the signal side drive circuit 38, CK1 is a latch signal which reads and holds an indicative data, and CK2 is an output timing signal which makes the timing which outputs the indicative data latched by CK1. And this CK2 is delayed by 1/2 phase to CK1, and is outputting data to

the falling timing of the pulse of this CK2. Here, although it was made to output data using falling of CK2, it differs by whether positive logic is used for the logic by the side of a drive circuit, or negative logic is used, and data can be read to the timing which starts.

[0052] Drawing 6 is the timing chart of the various signals and input data which are inputted into the scan side drive circuit 39 of drawing 2 . The data enabling V signal created as mentioned above chooses the output of the scan signal of 1V period (1 vertical-scanning period) from Rhine 1 equivalent to each vertical scan line to Rhine m. In order to make two lines each of the upper limit section of the display screen, and the lower limit section into the protection-from-light section 25, it is made to output even Rhine 3 - Rhine m-2 here except for Rhine 1, Rhine 2, Rhine m-1, and Rhine m. Moreover, in drawing 6 R> 6, Dout is the scan start signal of the scan side drive circuit 39, and CNB is a signal which transmits the scan signal of the scan side drive circuit 39. Although this CNB transmitted the scan signal using the falling timing of a pulse, it differs by whether positive logic is used for the logic by the side of a drive circuit also in this case, or negative logic is used, and can transmit a scan signal to the timing which starts.

[0053] Drawing 7 is a logic explanatory view in case a data enable signal performs output selection of an indicative data. As shown in drawing 7 , an in-house data, data enabling [H], and data enabling [V] are inputted into the AND gate, respectively, and it is outputted as output data with which the AND output drives liquid crystal. Therefore, only when the in-house data whose all are "H" and data enabling [H] and whose it data enabling [V] are image data is outputted, image display is made, and the pixel of a protection-from-light condition is formed except it.

[0054] Next, actuation of this example is explained. the protection-from-light section 25 which turns into an inside periphery of the view area 23 of the liquid crystal display panel 21 shown in drawing 1 with the liquid crystal television 31 shown in drawing 2 according to extent of the scattered reflection of the back light by the contents of a display displayed on the liquid crystal display panel 21, the illuminance of a back light, or the sealing agent from the pixel (henceforth [this example] a dummy pixel) changed into the protection-from-light condition -- place fixed ****** -- liquid crystal is made to drive like It can prevent that light leaks from between the inactive area 22 and the view area 23 which are shown in drawing 1 by this, and proper image display can be performed. The above-mentioned width of face of the protection-from-light section 25 can be adjusted according to the signal wave form of data enabling [which makes it generate in the data enabling generating circuit (to refer to drawing 3) built in in the controller 37 shown in drawing 2].

[0055] First, the liquid crystal television 31 of drawing 2 receives a television broadcasting electric wave through an antenna 32, and displays the receiving image on the liquid crystal display panel 21. In drawing 2 , the received electric wave received with the antenna 32 is supplied to a tuner 33. In a tuner 33, an assignment channel is chosen according to the tuning control signal inputted from a controller 37, the received electric wave supplied from an antenna 32 is changed into an intermediate frequency signal, and it outputs to a receiving circuit 34. In a receiving circuit 34, an image detector circuit performs image detection for the intermediate frequency signal inputted from a tuner 33, a color video signal is taken out, and it outputs to the voice circuit which does not take out and illustrate a sound signal out of this color video signal, and by the image amplifying circuit, a color video signal is amplified and it outputs to a chroma circuit. A chroma circuit separates each color video signal of R, G, and B from a color video signal, and outputs it to the A/D-conversion circuit 36. And the status signal which drives the pixel of the predetermined color filter location of R, G, and B from the A/D-conversion circuit 36 is outputted to the signal side drive circuit 38.

[0056] In the case of the liquid crystal television 31 of this example, the data enable signal which consists of a predetermined pattern based on Horizontal Synchronizing signal Hsync, Vertical Synchronizing signal Vsync, and basic clock which are inputted into a controller 37 from a synchronous circuit 35 is created. This data enable signal has data enabling [which chooses a horizontal status signal / H], and data enabling [which choose a vertical scan signal / V].

[0057] If a Horizontal Synchronizing signal and a basic clock are inputted into the n bit counter 44 of the data enabling H generating circuit 42 shown in drawing 3 , data enabling [H] starts the count of a

basic clock based on the Horizontal Synchronizing signal, decodes the counted value by the decoder 45, and creates the set pulse and reset pulse which are outputted to predetermined timing, and the n bit counter 44 will output it to NAND gates 46 and 47, and will create it. If data enabling [H] is set to "H" by the set pulse as shown in drawing 4 and drawing 5 , it will start selection of output data, and if it is set to "L" by the reset pulse, it will end selection of output data. For this reason, the pixel for 2 dots of a right-and-left edge is driven as a protection-from-light condition, and the protection-from-light section 25 is formed.

[0058] Moreover, if a Vertical Synchronizing signal and a basic clock are inputted into the m bit counter 48 of the data enabling V generating circuit 43 shown in drawing 3 , data enabling [V] starts the count of a basic clock based on the Vertical Synchronizing signal, decodes the counted value by the decoder 49, and creates the set pulse and reset pulse which are outputted to predetermined timing, and the m bit counter 48 will output it to NAND gates 50 and 51, and will create it. And also in data enabling [V], if it is set to "H" by the set pulse as shown in drawing 4 and drawing 6 , selection of display Rhine will be started, and if set to "L" by the reset pulse, selection of display Rhine will be ended. For this reason, two lines of a vertical edge are driven as a protection-from-light condition, and the protection-from-light section 25 is formed.

[0059] Namely, as shown in drawing 7 , the display drive of liquid crystal is performed by the pixel as which the in-house data which is a status signal is inputted when all are "H", and above-mentioned data enabling [H] and above-mentioned data enabling [V] will be in a protection-from-light condition in the other pixel.

[0060] Since the protection-from-light section 25 which made intentionally the periphery section of the view area 23 shown in drawing 1 by using the liquid crystal drive approach of this example the protection-from-light condition can be formed as described above, the leakage of the light of a back light can be prevented and proper image display can be performed.

[0061] Moreover, the above-mentioned width of face of the protection-from-light section 25 is narrow, and when the light of a back light does not leak to a screen side, or the width of face of the protection-from-light section 25 is wide and the image of the edge of the four directions of the image display section 24 does not look opposite, it is possible to only generate the data enable signal wave according to a display situation, to carry out adjustable [of the width of face of the protection-from-light section 25] suitably, and to display it.

[0062] Next, drawing 8 is the block diagram showing the configuration of the liquid crystal television 61 concerning other examples. That is, the protection-from-light section 25 as shown in above-mentioned drawing 1 can also be formed using the liquid crystal television 61 as shown in drawing 8 .

[0063] In addition, in drawing 8 , since the liquid crystal display panel 21 of a liquid crystal television 61, the A/D-conversion circuit 36, a controller 37, the signal side drive circuit 38, and the scan side drive circuit 39 are the same sections as the configuration section or the considerable sections of drawing 2 of the above-mentioned example, they attach the same sign and omit explanation.

[0064] The characteristic configuration of drawing 8 is the point of providing memory 62 and the indicative-data output-control section 63, chooses whether an indicative data is outputted as it is in the indicative-data output-control section 63, or it permutes and outputs to a non-display driving signal based on the selection signal beforehand stored in memory 62 corresponding to each pixel location, and outputs which liquid crystal driving signal to the signal side drive circuit 38.

[0065] The above-mentioned memory 62 specifically consists of a ROM (Read Only Memory), RAM (Random Access Memory), etc., and the selection signal which chooses whether the indicative data outputted from the A/D-conversion circuit 36 is outputted as it is or the non-display driving signal which drives liquid crystal so that it may be in a protection-from-light condition is permuted by the indicative data makes it correspond to each pixel location of the liquid crystal display panel 21, and is memorized beforehand.

[0066] Moreover, the indicative-data output-control section 63 collates with the selection signal of the pixel location of the memory 62 corresponding to the display position the indicative data inputted from the above-mentioned A/D-conversion circuit 36, and in the case of the indicative data of the pixel

location which forms the protection-from-light section, an indicative data is permuted by the non-display driving signal, and it outputs it to the signal side drive circuit 38. Moreover, in the case of the indicative data of the pixel location which does not form the protection-from-light section, an indicative data is outputted to the signal side drive circuit 38 as it is, and it carries out image display.
[0067] Drawing 9 is the timing chart of the selection signal which the selection signal stored in memory 62 was made to correspond to the pixel location of a liquid crystal display panel, and read it. As shown in drawing 9 , when a selection signal is "H", priority is given to a non-display driving signal over an indicative data, and it is outputted to the signal side drive circuit 38, when a selection signal is "L", priority is given to the indicative data from the A/D-conversion circuit 36, and it is outputted to the signal side drive circuit 38.
[0068] In addition, as shown in drawing 9 , in this example, although data enabling [H] is outputted, an indicative data is not outputted alternatively here, and it is always set to "H" during each horizontal scanning period, and all indicative datas are outputted.
[0069] Drawing 10 is an example of image display at the time of performing image display based on the selection signal stored in the memory 62 of drawing 9 . In drawing 10 , the part to which each grid in the view area 71 is equivalent to a pixel, and is carried out the network or injury sake in it is the protection-from-light section 72 which permuted the indicative data by the non-display driving signal, and was made into the protection-from-light condition, and the field of the shape of a rectangle of the inside is the image display section 73 which displays an indicative data as it is further.
[0070] As shown in drawing 10 also in this example, it is two lines (one line) in a vertical edge, respectively. Since the pixel field for 2 dots (1 dot, 2 dots, n-1 dot, n dots) was formed as the protection-from-light section 72 at two lines, m-1 line, m lines, and the right-and-left edge, The light of the back light which leaks from the boundary line of the inactive area which is not illustrated and the view area 71 is covered, and a proper liquid crystal display image came to be obtained.
[0071] Of course, also in this example, it is possible to change suitably the field width of face of the protection-from-light section 72. That is, the data beforehand stored in the memory 62 of drawing 8 are changed, and the selection signal which chooses a non-display driving signal is stored in the pixel location of the field of desired width of face. For example, it makes a vertical edge into four lines at a time, and it can make it 4 dots at a time, or it can also constitute so that the number of pixels which covers a right-and-left edge in a vertical edge and a right-and-left edge may be changed. Moreover, if some kinds of above-mentioned pattern data are given to ROM and RAM of memory 62 in this way, the width of face of the protection-from-light section to wish can be easily obtained only by choosing a pattern predetermined by the user side.
[0072] In addition, although the above-mentioned example explained the case where it applied to a liquid crystal television, it is not limited to this, and if it is the liquid crystal display of the transparency mold which used the back light used for the liquid crystal display for games, the liquid crystal display of information machines and equipment, etc., it can carry out similarly.
[0073]
[Effect of the Invention] Since according to the liquid crystal display drive approach according to claim 1 the liquid crystal drive of the pixel of the predetermined field of the periphery section of a transparence substrate is carried out so that it may be in a protection-from-light condition during image display at least, it can prevent that make the pixel of the predetermined field of the periphery section of a transparence substrate into a protection-from-light condition during image display at least, and light leaks the back light light by which scattered reflection is carried out near the sealing agent of the inactive area where liquid crystal is not poured in from a liquid crystal display side.
[0074] According to the liquid crystal display drive approach according to claim 2, the pixel of the predetermined field of the periphery section of a transparence substrate A part for each of several lines of the upper limit section of a liquid crystal display field, and the lower limit section, Since the liquid crystal of the pixel in those fields is driven as a pixel for several dots each of the left end section of a liquid crystal display field, and the right end section so that it may be in a protection-from-light condition In the vertical edge of a liquid crystal display field, while driving two or more lines in the

protection-from-light condition In the right-and-left edge of a liquid crystal display field, since several dots of the beginning of level Rhine and the last are driven in the protection-from-light condition, it can prevent that back light light leaks by making the pixel of the predetermined field near the inside of a sealing agent into a protection-from-light condition.

[0075] Since according to the liquid crystal display drive approach according to claim 3 modification of the range of the protection-from-light field which drives liquid crystal according to the size of the viewing area of a liquid crystal cell was respectively enabled at the vertical edge and the right-and-left edge so that a predetermined field may be in a protection-from-light condition, it becomes possible to change a protection-from-light field suitably according to the contents of a display, or the leakage condition of back light light, and the always optimal display condition is acquired.

[0076] Since according to the liquid crystal display drive approach according to claim 4 a protection-from-light condition is formed with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives a counterelectrode, and a scan side mechanical component, respectively in case the liquid crystal of the pixel in a predetermined field is driven, the timing which forms the range and protection-from-light field of the protection-from-light field is freely [easily and] controllable.

[0077] Since according to the liquid crystal display drive approach according to claim 5 it chooses whether priority is given to a driving signal based on the selection signal beforehand memorized to the signal side mechanical component which drives a counterelectrode corresponding to each pixel location, or priority is given to a non-display signal and liquid crystal is driven based on the selection result in case the liquid crystal of the pixel in a predetermined field is driven, range, timing, etc. of a field which shade are freely [easily and] controllable.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the liquid crystal display drive approach of driving the liquid crystal of a liquid crystal display panel, making a light transmission condition and a protection-from-light condition, and performing image display, irradiating light with a back light.

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PRIOR ART

[Description of the Prior Art] If the optical activity of the liquid crystal to which the polarization direction of light is changed is conventionally used, for example from the orientation of a liquid crystal molecule changing and the optical property of liquid crystal changing, if a liquid crystal display impresses a predetermined electrical potential difference to liquid crystal, light will penetrate the light irradiated by two polarizing plates from one side on both sides of a liquid crystal cell depending on how to combine the polarization direction of two polarizing plates, or it will be shaded. Moreover, although the array of a liquid crystal molecule becomes random and it will be in the condition that light is scattered about and light does not penetrate if an electrical potential difference is impressed to liquid crystal when using the light-scattering effectiveness of liquid crystal, a light transmission condition is acquired in the condition of not impressing an electrical potential difference to liquid crystal.
[0003] Drawing 11 is the sectional view of the liquid crystal display panel 1 using the optical property of the above-mentioned liquid crystal, and drawing 12 is the front view of the liquid crystal display panel 1 which looked at drawing 11 R> 1 from the screen side.
[0004] As shown in drawing 11 , the liquid crystal display panel 1 applies and closes a sealing agent 4 in the periphery section between the upper glass substrate 2 and the bottom glass substrate 3, and constitutes the liquid crystal cell which pours in liquid crystal. And two or more arrangement of the common electrode 6 is carried out at the shape of a stripe at the longitudinal direction of drawing in the direction which intersects perpendicularly with the above-mentioned segment electrode 5 at the opposed face side of the bottom glass substrate 3 at it while two or more arrangement of the segment electrode 5 is carried out in the depth direction of drawing to the opposed face of the upper glass substrate 2 at the shape of a stripe.
[0005] Here, the liquid crystal display panel of drawing 11 is an electrochromatic display display panel, and since the intersection parts of the above-mentioned segment electrode 5 and the common electrode 6 constitute the pixel, the color filter (R, G, B) is formed in each pixel location. And this liquid crystal display panel 1 consists of polarizing plates 8 and 9 on both sides of the vertical glass substrates 2 and 3 in order to make the transparency condition and protection-from-light condition of light using the optical activity of the above-mentioned liquid crystal.
[0006] And the white light of the back light irradiated from the lower part of drawing 11 controls the orientation of a liquid crystal molecule by the liquid crystal driving signal impressed to the above-mentioned segment electrode 5 and the common electrode 6 for every pixel, and is performing the desired electrochromatic display display according to the transmitted light condition and the protection-from-light condition.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] Since according to the liquid crystal display drive approach according to claim 1 the liquid crystal drive of the pixel of the predetermined field of the periphery section of a transparence substrate is carried out so that it may be in a protection-from-light condition during image display at least, it can prevent that make the pixel of the predetermined field of the periphery section of a transparence substrate into a protection-from-light condition during image display at least, and light leaks the back light light by which scattered reflection is carried out near the sealing agent of the inactive area where liquid crystal is not poured in from a liquid crystal display side.
[0074] According to the liquid crystal display drive approach according to claim 2, the pixel of the predetermined field of the periphery section of a transparence substrate A part for each of several lines of the upper limit section of a liquid crystal display field, and the lower limit section, Since the liquid crystal of the pixel in those fields is driven as a pixel for several dots each of the left end section of a liquid crystal display field, and the right end section so that it may be in a protection-from-light condition In the vertical edge of a liquid crystal display field, while driving two or more lines in the protection-from-light condition In the right-and-left edge of a liquid crystal display field, since several dots of the beginning of level Rhine and the last are driven in the protection-from-light condition, it can prevent that back light light leaks by making the pixel of the predetermined field near the inside of a sealing agent into a protection-from-light condition.
[0075] Since according to the liquid crystal display drive approach according to claim 3 modification of the range of the protection-from-light field which drives liquid crystal according to the size of the viewing area of a liquid crystal cell was respectively enabled at the vertical edge and the right-and-left edge so that a predetermined field may be in a protection-from-light condition, it becomes possible to change a protection-from-light field suitably according to the contents of a display, or the leakage condition of back light light, and the always optimal display condition is acquired.
[0076] Since according to the liquid crystal display drive approach according to claim 4 a protection-from-light condition is formed with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives a counterelectrode, and a scan side mechanical component, respectively in case the liquid crystal of the pixel in a predetermined field is driven, the timing which forms the range and protection-from-light field of the protection-from-light field is freely [easily and] controllable.
[0077] Since according to the liquid crystal display drive approach according to claim 5 it chooses whether priority is given to a driving signal based on the selection signal beforehand memorized to the signal side mechanical component which drives a counterelectrode corresponding to each pixel location, or priority is given to a non-display signal and liquid crystal is driven based on the selection result in case the liquid crystal of the pixel in a predetermined field is driven, range, timing, etc. of a field which shade are freely [easily and] controllable.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, if it is in such a conventional liquid crystal display drive approach, it is divided into the view area 11 which performs the liquid crystal display into which the segment electrode 5 and the common electrode 6 were arranged, and liquid crystal was poured, and the inactive area 10 where it consists of sealing agent 4 grades, and liquid crystal is not poured in as shown in drawing 11 . And if a back light is irradiated from under a liquid crystal display panel, in the inactive area 10 without liquid crystal, light will penetrate as it is and transparency/protection-from-light condition of light will be repeated in the view area 11 where liquid crystal was poured in according to the drive conditions of liquid crystal.
[0008] For this reason, although the film in which the black mask for covering light was formed on the inactive area 10 of the polarizing plate 8 by the side of the upper glass substrate 2 of drawing 11 was arranged in the former From the light which passes through the inactive area 10 reflecting irregularly in the sealing agent 4 neighborhood The inactive area 10 cannot be covered with a black mask, and light cannot be completely covered only by the wrap, but there is a problem that the light of a back light leaks from between the inactive area 10 and the view area 11 which are shown in drawing 12 .
[0009] Moreover, a wrap sacrifice aperture may be prepared conventionally, applying the above-mentioned inactive area 10 with a black mask to the inactive area 10 to a part of view area 11 in addition to a wrap. However, since the area to cover is being fixed, this sacrifice aperture has the problem that a display rectangle becomes narrow depending on the contents of a display.
[0010] This invention is made in view of the above-mentioned technical problem, and aims at offering the liquid crystal display drive approach that the proper display which does not have the leakage of the light from a back light only by operating a liquid crystal driving signal simply is obtained.

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MEANS

[Means for Solving the Problem] Invention according to claim 1 forms the pixel which has arranged the counterelectrode for a liquid crystal drive to the opposed face of the transparence substrate of a pair, and the liquid crystal cell which closed the periphery section between the transparence substrates of said pair with the sealing agent is filled up with liquid crystal. It is the liquid crystal display drive approach which impresses a predetermined electrical potential difference to the liquid crystal for every pixel for said counterelectrode by the signal side mechanical component and the scan side mechanical component, and forms and carries out image display of a light transmission condition and the protection-from-light condition while irradiating light from the single-sided field of said transparence substrate. The above-mentioned purpose is attained by driving liquid crystal so that it may be in a protection-from-light condition during image display at least about the pixel of the predetermined field of the periphery section of said transparence substrate.
[0012] Moreover, in this invention, the pixel of the predetermined field of the periphery section of said transparence substrate may consist of a pixel for several dots each of the upper limit section of a liquid crystal display field, a part for each of several lines of the lower limit section and the left end section of a liquid crystal display field, and the right end section so that may be indicated by claim 2, and at least during image display, the liquid crystal of the pixel in those fields may be driven so that it may be in a protection-from-light condition.
[0013] Furthermore, you may make it change at least each value of the vertical edge of the protection-from-light field which drives liquid crystal according to the size of the viewing area of said liquid crystal cell so that a predetermined field may be in a protection-from-light condition, and a right-and-left edge during image display so that this invention may be indicated by claim 3.
[0014] Moreover, in case this invention drives the liquid crystal of the pixel in said predetermined field so that it may be indicated by claim 4, you may make it form a protection-from-light condition with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives said counterelectrode, and a scan side mechanical component, respectively.
[0015] Moreover, in case this invention drives the liquid crystal of the pixel in said predetermined field so that it may be indicated by claim 5, it chooses whether priority is given to a driving signal based on the selection signal beforehand memorized corresponding to each pixel location in the indicative data outputted to the signal side mechanical component which drives said counterelectrode, or priority is given to a non-display signal, and you may make it drive liquid crystal based on the selection result.
[0016]

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OPERATION

[Function] By the liquid crystal display drive approach according to claim 1, liquid crystal is driven so that it may be in a protection-from-light condition during image display at least about the pixel of the predetermined field of the periphery section of a transparence substrate. Therefore, since the back light light by which scattered reflection is carried out near the sealing agent of the inactive area where liquid crystal is not poured in makes the predetermined field pixel of the periphery section of a transparence substrate a protection-from-light condition during image display at least, it can prevent that light leaks from a liquid crystal display side.
[0017] By the liquid crystal display drive approach according to claim 2, the pixel of the predetermined field of the periphery section of a transparence substrate consists of a pixel for several dots each of the upper limit section of a liquid crystal display field, a part for each of several lines of the lower limit section and the left end section of a liquid crystal display field, and the right end section, and the liquid crystal of the pixel in those fields is driven so that it may be in a protection-from-light condition.
[0018] Therefore, in the vertical edge of a liquid crystal display field, while driving two or more lines in the protection-from-light condition, in the right-and-left edge of a liquid crystal display field, it can prevent that back light light leaks by making the pixel of the predetermined field near the inside of a sealing agent into a protection-from-light condition by driving several dots of the beginning of level Rhine, and the last in the protection-from-light condition.
[0019] By the liquid crystal display drive approach according to claim 3, the value of the vertical edge of the protection-from-light field which drives liquid crystal according to the size of the viewing area of a liquid crystal cell so that a predetermined field may be in a protection-from-light condition, and a right-and-left edge is changed, respectively.
[0020] Therefore, since the range of the predetermined field made into a protection-from-light condition during image display at least is changed by the drive of liquid crystal, it becomes possible to change a protection-from-light field suitably according to the contents of a display, or the leakage condition of back light light, and the always optimal display condition can be acquired.
[0021] By the liquid crystal display drive approach according to claim 4, in case the liquid crystal of the pixel in a predetermined field is driven, a protection-from-light condition is formed with the enable signal to which a driving signal is made to output alternatively according to scan timing to the signal side mechanical component which drives a counterelectrode, and a scan side mechanical component, respectively.
[0022] Therefore, since a protection-from-light field is formed using the enable signal which chooses whether the driving signal of liquid crystal is outputted, the timing which forms the range and protection-from-light field of the protection-from-light field is freely [easily and] controllable.
[0023] By the liquid crystal display drive approach according to claim 5, in case the liquid crystal of the pixel in a predetermined field is driven, it chooses whether priority is given to a driving signal based on the selection signal beforehand memorized corresponding to each pixel location in the indicative data outputted to the signal side mechanical component which drives a counterelectrode, or priority is given to a non-display signal, and liquid crystal is driven based on the selection result.
[0024] Therefore, the selection signal corresponding to each pixel location is held in memory, such as ROM and RAM, and since it chooses whether a selection signal is read from here and the driving signal

is indicated by priority, or priority is given to a non-display signal and it changes into a protection-from-light condition and liquid crystal is driven, range, timing, etc. of a field which shade are freely [easily and] controllable.

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EXAMPLE

[Example] Hereafter, this invention is concretely explained based on an example. Drawing 1 - drawing 10 are drawings explaining the liquid crystal display drive approach of this invention, and are carried out by this example as a passive-matrix liquid crystal display using STN (Super Twisted Nematic) liquid crystal. Drawing 1 is the front view of the display of the liquid crystal display panel 21 displayed by the liquid crystal display drive approach of this example. If the liquid crystal display panel 21 of drawing 1 is seen from the screen, it consists of inactive area 22 and view area 23, and if image display is carried out using the liquid crystal display drive approach of this example, the inside of the above-mentioned view area 23 will be divided into the protection-from-light section 25 which changes the liquid crystal drive of the image display section 24 and the inside periphery section of the view area 23 which display an image further into a protection-from-light condition by predetermined width of face.
[0026] It is for preventing that the white light of a back light penetrates this sealing agent, or scattered reflection of having formed the protection-from-light section 25 by the liquid crystal drive approach is carried out with a sealing agent, and it leaks to a screen side since the inactive area 22 of the liquid crystal display panel 21 consists of sealing agents which close an up-and-down glass substrate first and liquid crystal is not poured in like this example. That is, since the above-mentioned inactive area 22 cannot usually cover the light which leaks a liquid crystal display panel from the boundary line of the inactive area 22 and the view area 23 although the leakage of light can be prevented by a wrap panel etc., the pixel of the inside periphery section of the view area 23 is made to drive as a protection-from-light condition at least during image display, and it prevents that light leaks.
[0027] As shown in drawing 1 R> 1, in this example, the upper limit section of the view area 23 and the lower limit section the above-mentioned protection-from-light section 25, respectively Two lines (one line, two lines, m-1 line, m lines) It constitutes from field width of face of the left end section and a right edge which is 2 dots (1 dot, 2 dots, n-1 dot, n dots), respectively, and at least during image display, a display drive is carried out so that it may be in a protection-from-light condition.
[0028] Drawing 2 is the block diagram showing the configuration of the liquid crystal television 31 with which the liquid crystal display panel 21 of drawing 1 was incorporated. This liquid crystal television 31 consists of an antenna 32, a tuner 33, a receiving circuit 34, a synchronous circuit 35, the A/D-conversion circuit 36, a controller 37, a signal side drive circuit 38, a scan side drive circuit 39, etc.
[0029] An antenna 32 supplies a received electric wave to a tuner 33, and a tuner 33 chooses an assignment channel according to the tuning control signal which is inputted from a controller 37 and which is not illustrated, changes into an intermediate frequency signal the received electric wave supplied from an antenna 32, and it outputs it to a receiving circuit 34.
[0030] A receiving circuit 34 is constituted by an intermediate frequency amplifying circuit, an image detector circuit, an image amplifying circuit, the chroma circuit, etc., performs image detection for the intermediate frequency signal inputted from a tuner 33 by the image detector circuit, takes out a color video signal, outputs it to the voice circuit which does not take out and illustrate a sound signal out of this color video signal, amplifies a color video signal by the image amplifying circuit, and outputs it to a chroma circuit. A chroma circuit separates each color video signal of R, G, and B from a color video

signal, and outputs it to the A/D-conversion circuit 36.
[0031] A synchronous circuit 35 takes out Horizontal Synchronizing signal Hsync and Vertical Synchronizing signal Vsync out of a color video signal, and outputs them to a controller 35.
[0032] Although the A/D-conversion circuit 36 is not illustrated, it consists of a sampling circuit, a comparator circuit, and an encoder circuit. After sampling the analog signal of R, G, and B functionally and carrying out A/D conversion (being the range of RHH-RLL division into equal parts) with a comparator, it changes into the digital display signal of a triplet in an encoder circuit.
[0033] A controller 37 is what controls actuation of the whole liquid crystal television 31. It is based on a Horizontal Synchronizing signal (Hsync) and a Vertical Synchronizing signal (Vsync). For example, make image display perform on the liquid crystal display panel 21, or The sampling clock which is not illustrated in the A/D-conversion circuit 36 is generated and supplied, or the internal basic clocks CK1 and CK2 with two phases which determine the reading timing of liquid crystal drive data and the output timing of data are generated, and the signal side drive circuit 38 is supplied. Moreover, the controller 37 of this example contains the circuit which creates the data enabling H signal to which a status signal is made to output alternatively based on a Horizontal Synchronizing signal, and the circuit which creates the data enabling V signal to which scan data are made to output alternatively based on a Vertical Synchronizing signal.
[0034] This Vertical Synchronizing signal consists of the CNB signal which carries out the sequential shift of the CFB signal which is a scan reversal signal for carrying out the alternating current drive of the CDB signal and liquid crystal which determine the selection width of face of scan electrode scan initiation timing and a scan electrode for every frame, and said CDB signal in the scan side drive circuit 23.
[0035] Moreover, the Horizontal Synchronizing signal consists of the CKN signal which outputs the status signal which latched the status signal to the signal electrode and was stored in the signal side drive circuit 38 to the liquid crystal display panel 21, the CKF signal for carrying out the alternating current drive of the STi signal and liquid crystal which carry out sampling initiation of the status signal for every frame, and CK1 and CK2 signal which is a basic clock signal of the signal side drive circuit 38.
[0036] The liquid crystal display panel 21 is what was carried out here using the liquid crystal cell which enclosed STN LCD, and the signal electrode and scan electrode which become the opposed face of two transparence substrates which consisted of glass plates from ITO are arranged in the rectangular direction, respectively.
[0037] The signal side drive circuit 38 outputs alternatively the status signal which the data enabling H signal created by the controller 37 is inputted, and is inputted from the A/D-conversion circuit 36 described above with this data enabling H signal, and drives the predetermined signal electrode of the liquid crystal display panel 24.
[0038] The data enabling V signal created by the controller 37 is inputted, and the scan side drive circuit 39 outputs alternatively the scan signal generated with this data enabling V signal, and drives the scan electrode of predetermined Rhine of the liquid crystal display panel 24 while it generates a scan signal.
[0039] Thus, by outputting a status signal and a scan signal alternatively using data enabling [of a horizontal direction and a perpendicular direction / H], and data enabling [V], the liquid crystal display drive approach of this example can drive liquid crystal so that the pixel of the predetermined field of a liquid crystal display panel may be made into a protection-from-light condition and the other field may be made into the viewing area of image data. Here, as shown in drawing 1 , the protection-from-light section 25 which makes a pixel a protection-from-light condition obtains a proper display image as field width of face for 2 dots by [of the upper limit section of the view area 23, and the lower limit section] covering the white light of the back light of two lines, and the left end section and the right end section which leaks from the boundary line of the inactive area 22 and the view area 23, respectively.
[0040] Drawing 3 is a circuit diagram of the data enabling generating circuit 41 of a horizontal direction and a perpendicular direction built in the controller 37 of drawing 2 . In drawing 3 , the circuit of an upper case is the data enabling H generating circuit 42 which generates horizontal data enabling [H], and the circuit of the lower berth is the data enabling V generating circuit 43 which generates vertical

data enabling [V].
[0041] The data enabling H generating circuit 42 inputs into one side of each input terminal of two NAND gates 46 and 47 the set pulse and reset pulse which are outputted from the n bit counter 44 according to the number of n signal electrodes, the decoder 45 which decodes the counted value, and a decoder 45, connects each output of two NAND gates 46 and 47 to another input terminal of the gate of another side, and is constituted. And a basic clock is counted based on the Horizontal Synchronizing signal inputted into the n bit counter 44, the counted value is decoded by the decoder 45, the set pulse and reset pulse which are outputted to predetermined timing are created, and it outputs to NAND gates 46 and 47.
[0042] Moreover, the data enabling V generating circuit 43 inputs into one side of each input terminal of two NAND gates 50 and 51 the set pulse and reset pulse which are outputted from the m bit counter 48 according to the number of M scan electrodes, the decoder 49 which decodes the counted value, and a decoder 49, connects each output of two NAND gates 50 and 51 to another input terminal of the gate of another side, and is constituted. And a basic clock is counted based on the Vertical Synchronizing signal inputted into the m bit counter 48, the counted value is decoded by the decoder 49, the set pulse and reset pulse which are outputted to predetermined timing are created, and it outputs to NAND gates 50 and 51.
[0043] Drawing 4 is a timing chart of a set pulse, a reset pulse, and a data enable signal which makes it generate by the data enabling generating circuit of drawing 3 . An enable signal is generated by operations sequence with same above-mentioned data enabling H generating circuit 42 and above-mentioned data enabling V generating circuit 43. Here, the data enabling H generating circuit 42 is mentioned as an example, and is explained.
[0044] That is, to the timing of A of drawing 4 , "H" of a set pulse and a reset pulse is inputted into one input terminal of NAND gates 46 and 47, respectively. Although the input terminal of another side of NAND gate 46 is indefinite in "L" and "H" at this time, since the input terminal of another side of NAND gate 47 and the output terminal of NAND gate 46 are connected and it is set to "L", the output of NAND gate 47 is set to "H." Therefore, data enabling [to which NAND gate 46 is outputted since "H-H" is inputted consequently / H] is set to "L."
[0045] Next, to the timing of B of drawing 4 , since a set pulse is set to "L", "L-H" is inputted, consequently, as for the input terminal of NAND gate 46, "H" is outputted. And since the "H" is inputted into the input terminal of another side of NAND gate 47, the input of NAND gate 47 serves as "H-H", and "L" is outputted. Therefore, since "L" is inputted into the input terminal of another side of NAND gate 46, "L-L" will be inputted and data enabling [which is outputted / H] is set to "H."
[0046] Next, to the timing of C of drawing 4 , since a set pulse returns to "H", "H-L" is inputted, consequently, as for the input terminal of NAND gate 46, "H" is outputted from NAND gate 46. And since the "H" is inputted into the input terminal of another side of NAND gate 47, the input of NAND gate 47 serves as "H-H", and "L" is outputted. Therefore, since "L" is inputted into the input terminal of another side of NAND gate 46, data enabling [which "H-L" is inputted, consequently is outputted from NAND gate 46 / H] is still "H."
[0047] Next, to the timing of D of drawing 4 , since a reset pulse is set to "L", "H-L" is inputted, consequently, as for the input terminal of NAND gate 47, "H" is outputted from NAND gate 47. And since the "H" is inputted into the input terminal of another side of NAND gate 46, the input of NAND gate 46 serves as "H-H", and it changes the output of the data enabling [H] to "L."
[0048] Next, to the timing of E of drawing 4 , since a reset pulse is set to "H", "L-H" is inputted, consequently, as for the input terminal of NAND gate 47, "H" is outputted from NAND gate 47. And since the "H" is inputted into the input terminal of another side of NAND gate 46, the input of NAND gate 46 serves as "H-H", and the output of the data enabling [H] is still "L."
[0049] Horizontal and the data enable signal of a proper in a perpendicular direction can be outputted as mentioned above, respectively from the data enabling H generating circuit 42 and the data enabling V generating circuit 43. It chooses whether this data enable signal outputs the status signal in a horizontal direction, and the scan signal in a perpendicular direction, respectively, and the liquid crystal drive based

on image data is not performed, but the pixel part which does not output a liquid crystal driving signal will be in a protection-from-light condition.
[0050] The liquid crystal display panel currently used for the liquid crystal television of this example will be in the dark condition it is made not to keep covering light when the effective voltage impressed to a pixel is below a predetermined value, in order to carry out negative inverse video, and when the effective voltage conversely impressed to a pixel is beyond a predetermined value, it will be in the bright state which makes the white light of a back light penetrate.
[0051] Drawing 5 is the timing chart of the various signals and input data which are inputted into the signal side drive circuit 38 of drawing 2 . The data enabling H signal created as mentioned above chooses the output of the status signal of 1H period (1 horizontal-scanning period) from the data 1 equivalent to each horizontal pixel to Data n. In order to make 2 dots each of the left end section of a display screen, and the right end section into the protection-from-light section 25, it is made to output even data 3 - data n-2 here except for data 1, data 2, data n-1, and Data n. Moreover, in drawing 5 , STi is the data sampling start signal of the signal side drive circuit 38, CK1 is a latch signal which reads and holds an indicative data, and CK2 is an output timing signal which makes the timing which outputs the indicative data latched by CK1. And this CK2 is delayed by 1/2 phase to CK1, and is outputting data to the falling timing of the pulse of this CK2. Here, although it was made to output data using falling of CK2, it differs by whether positive logic is used for the logic by the side of a drive circuit, or negative logic is used, and data can be read to the timing which starts.
[0052] Drawing 6 is the timing chart of the various signals and input data which are inputted into the scan side drive circuit 39 of drawing 2 . The data enabling V signal created as mentioned above chooses the output of the scan signal of 1V period (1 vertical-scanning period) from Rhine 1 equivalent to each vertical scan line to Rhine m. In order to make two lines each of the upper limit section of the display screen, and the lower limit section into the protection-from-light section 25, it is made to output even Rhine 3 - Rhine m-2 here except for Rhine 1, Rhine 2, Rhine m-1, and Rhine m. Moreover, in drawing 6 R> 6, Dout is the scan start signal of the scan side drive circuit 39, and CNB is a signal which transmits the scan signal of the scan side drive circuit 39. Although this CNB transmitted the scan signal using the falling timing of a pulse, it differs by whether positive logic is used for the logic by the side of a drive circuit also in this case, or negative logic is used, and can transmit a scan signal to the timing which starts.
[0053] Drawing 7 is a logic explanatory view in case a data enable signal performs output selection of an indicative data. As shown in drawing 7 , an in-house data, data enabling [H], and data enabling [V] are inputted into the AND gate, respectively, and it is outputted as output data with which the AND output drives liquid crystal. Therefore, only when the in-house data whose all are "H" and data enabling [H] and whose it data enabling [V] are image data is outputted, image display is made, and the pixel of a protection-from-light condition is formed except it.
[0054] Next, actuation of this example is explained. the protection-from-light section 25 which turns into an inside periphery of the view area 23 of the liquid crystal display panel 21 shown in drawing 1 with the liquid crystal television 31 shown in drawing 2 according to extent of the scattered reflection of the back light by the contents of a display displayed on the liquid crystal display panel 21, the illuminance of a back light, or the sealing agent from the pixel (henceforth [this example] a dummy pixel) changed into the protection-from-light condition -- place fixed ****** -- liquid crystal is made to drive like It can prevent that light leaks from between the inactive area 22 and the view area 23 which are shown in drawing 1 by this, and proper image display can be performed. The above-mentioned width of face of the protection-from-light section 25 can be adjusted according to the signal wave form of data enabling [which makes it generate in the data enabling generating circuit (to refer to drawing 3) built in in the controller 37 shown in drawing 2].
[0055] First, the liquid crystal television 31 of drawing 2 receives a television broadcasting electric wave through an antenna 32, and displays the receiving image on the liquid crystal display panel 21. In drawing 2 , the received electric wave received with the antenna 32 is supplied to a tuner 33. In a tuner 33, an assignment channel is chosen according to the tuning control signal inputted from a controller 37,

the received electric wave supplied from an antenna 32 is changed into an intermediate frequency signal, and it outputs to a receiving circuit 34. In a receiving circuit 34, an image detector circuit performs image detection for the intermediate frequency signal inputted from a tuner 33, a color video signal is taken out, and it outputs to the voice circuit which does not take out and illustrate a sound signal out of this color video signal, and by the image amplifying circuit, a color video signal is amplified and it outputs to a chroma circuit. A chroma circuit separates each color video signal of R, G, and B from a color video signal, and outputs it to the A/D-conversion circuit 36. And the status signal which drives the pixel of the predetermined color filter location of R, G, and B from the A/D-conversion circuit 36 is outputted to the signal side drive circuit 38.

[0056] In the case of the liquid crystal television 31 of this example, the data enable signal which consists of a predetermined pattern based on Horizontal Synchronizing signal Hsync, Vertical Synchronizing signal Vsync, and basic clock which are inputted into a controller 37 from a synchronous circuit 35 is created. This data enable signal has data enabling [which chooses a horizontal status signal / H], and data enabling [which choose a vertical scan signal / V].

[0057] If a Horizontal Synchronizing signal and a basic clock are inputted into the n bit counter 44 of the data enabling H generating circuit 42 shown in drawing 3 , data enabling [H] starts the count of a basic clock based on the Horizontal Synchronizing signal, decodes the counted value by the decoder 45, and creates the set pulse and reset pulse which are outputted to predetermined timing, and the n bit counter 44 will output it to NAND gates 46 and 47, and will create it. If data enabling [H] is set to "H" by the set pulse as shown in drawing 4 and drawing 5 , it will start selection of output data, and if it is set to "L" by the reset pulse, it will end selection of output data. For this reason, the pixel for 2 dots of a right-and-left edge is driven as a protection-from-light condition, and the protection-from-light section 25 is formed.

[0058] Moreover, if a Vertical Synchronizing signal and a basic clock are inputted into the m bit counter 48 of the data enabling V generating circuit 43 shown in drawing 3 , data enabling [V] starts the count of a basic clock based on the Vertical Synchronizing signal, decodes the counted value by the decoder 49, and creates the set pulse and reset pulse which are outputted to predetermined timing, and the m bit counter 48 will output it to NAND gates 50 and 51, and will create it. And also in data enabling [V], if it is set to "H" by the set pulse as shown in drawing 4 and drawing 6 , selection of display Rhine will be started, and if set to "L" by the reset pulse, selection of display Rhine will be ended. For this reason, two lines of a vertical edge are driven as a protection-from-light condition, and the protection-from-light section 25 is formed.

[0059] Namely, as shown in drawing 7 , the display drive of liquid crystal is performed by the pixel as which the in-house data which is a status signal is inputted when all are "H", and above-mentioned data enabling [H] and above-mentioned data enabling [V] will be in a protection-from-light condition in the other pixel.

[0060] Since the protection-from-light section 25 which made intentionally the periphery section of the view area 23 shown in drawing 1 by using the liquid crystal drive approach of this example the protection-from-light condition can be formed as described above, the leakage of the light of a back light can be prevented and proper image display can be performed.

[0061] Moreover, the above-mentioned width of face of the protection-from-light section 25 is narrow, and when the light of a back light does not leak to a screen side, or the width of face of the protection-from-light section 25 is wide and the image of the edge of the four directions of the image display section 24 does not look opposite, it is possible to only generate the data enable signal wave according to a display situation, to carry out adjustable [of the width of face of the protection-from-light section 25] suitably, and to display it.

[0062] Next, drawing 8 is the block diagram showing the configuration of the liquid crystal television 61 concerning other examples. That is, the protection-from-light section 25 as shown in above-mentioned drawing 1 can also be formed using the liquid crystal television 61 as shown in drawing 8 .

[0063] In addition, in drawing 8 , since the liquid crystal display panel 21 of a liquid crystal television 61, the A/D-conversion circuit 36, a controller 37, the signal side drive circuit 38, and the scan side

drive circuit 39 are the same sections as the configuration section or the considerable sections of drawing 2 of the above-mentioned example, they attach the same sign and omit explanation.
[0064] The characteristic configuration of drawing 8 is the point of providing memory 62 and the indicative-data output-control section 63, chooses whether an indicative data is outputted as it is in the indicative-data output-control section 63, or it permutes and outputs to a non-display driving signal based on the selection signal beforehand stored in memory 62 corresponding to each pixel location, and outputs which liquid crystal driving signal to the signal side drive circuit 38.
[0065] The above-mentioned memory 62 specifically consists of a ROM (Read Only Memory), RAM (Random Access Memory), etc., and the selection signal which chooses whether the indicative data outputted from the A/D-conversion circuit 36 is outputted as it is or the non-display driving signal which drives liquid crystal so that it may be in a protection-from-light condition is permuted by the indicative data makes it correspond to each pixel location of the liquid crystal display panel 21, and is memorized beforehand.
[0066] Moreover, the indicative-data output-control section 63 collates with the selection signal of the pixel location of the memory 62 corresponding to the display position the indicative data inputted from the above-mentioned A/D-conversion circuit 36, and in the case of the indicative data of the pixel location which forms the protection-from-light section, an indicative data is permuted by the non-display driving signal, and it outputs it to the signal side drive circuit 38. Moreover, in the case of the indicative data of the pixel location which does not form the protection-from-light section, an indicative data is outputted to the signal side drive circuit 38 as it is, and it carries out image display.
[0067] Drawing 9 is the timing chart of the selection signal which the selection signal stored in memory 62 was made to correspond to the pixel location of a liquid crystal display panel, and read it. As shown in drawing 9 , when a selection signal is "H", priority is given to a non-display driving signal over an indicative data, and it is outputted to the signal side drive circuit 38, when a selection signal is "L", priority is given to the indicative data from the A/D-conversion circuit 36, and it is outputted to the signal side drive circuit 38.
[0068] In addition, as shown in drawing 9 , in this example, although data enabling [H] is outputted, an indicative data is not outputted alternatively here, and it is always set to "H" during each horizontal scanning period, and all indicative datas are outputted.
[0069] Drawing 10 is an example of image display at the time of performing image display based on the selection signal stored in the memory 62 of drawing 9 . In drawing 10 , the part to which each grid in the view area 71 is equivalent to a pixel, and is carried out the network or injury sake in it is the protection-from-light section 72 which permuted the indicative data by the non-display driving signal, and was made into the protection-from-light condition, and the field of the shape of a rectangle of the inside is the image display section 73 which displays an indicative data as it is further.
[0070] As shown in drawing 10 also in this example, it is two lines (one line) in a vertical edge, respectively. Since the pixel field for 2 dots (1 dot, 2 dots, n-1 dot, n dots) was formed as the protection-from-light section 72 at two lines, m-1 line, m lines, and the right-and-left edge, The light of the back light which leaks from the boundary line of the inactive area which is not illustrated and the view area 71 is covered, and a proper liquid crystal display image came to be obtained.
[0071] Of course, also in this example, it is possible to change suitably the field width of face of the protection-from-light section 72. That is, the data beforehand stored in the memory 62 of drawing 8 are changed, and the selection signal which chooses a non-display driving signal is stored in the pixel location of the field of desired width of face. For example, it makes a vertical edge into four lines at a time, and it can make it 4 dots at a time, or it can also constitute so that the number of pixels which covers a right-and-left edge in a vertical edge and a right-and-left edge may be changed. Moreover, if some kinds of above-mentioned pattern data are given to ROM and RAM of memory 62 in this way, the width of face of the protection-from-light section to wish can be easily obtained only by choosing a pattern predetermined by the user side.
[0072] In addition, although the above-mentioned example explained the case where it applied to a liquid crystal television, it is not limited to this, and if it is the liquid crystal display of the transparency

mold which used the back light used for the liquid crystal display for games, the liquid crystal display of information machines and equipment, etc., it can carry out similarly.

[Translation done.]

NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the front view of the display of the liquid crystal display panel displayed by the liquid crystal display drive approach of this example.
[Drawing 2] It is the block diagram showing the configuration of the liquid crystal television with which the liquid crystal display panel of drawing 1 was incorporated.
[Drawing 3] It is the circuit diagram of the data enabling generating circuit of a horizontal direction and a perpendicular direction built in the controller of drawing 2 .
[Drawing 4] It is the timing chart of a set pulse, a reset pulse, and a data enable signal which makes it generate by the data enabling generating circuit of drawing 3 .
[Drawing 5] It is the timing chart of the various signals and input data which are inputted into the signal side drive circuit of drawing 2 .
[Drawing 6] It is the timing chart of the various signals and input data which are inputted into the scan side drive circuit of drawing 2 .
[Drawing 7] It is a logic explanatory view in case a data enable signal performs output selection of an indicative data.
[Drawing 8] It is the block diagram showing the configuration of the liquid crystal television concerning other examples.
[Drawing 9] It is the timing chart of the selection signal which the selection signal stored in memory was made to correspond to the pixel location of a liquid crystal display panel, and read it.
[Drawing 10] It is an example of image display at the time of performing image display based on the selection signal stored in the memory of drawing 9 .
[Drawing 11] It is the sectional view of the conventional liquid crystal display panel.
[Drawing 12] It is the front view of the liquid crystal display panel which looked at drawing 11 from the screen side.
[Description of Notations]
21 Liquid Crystal Display Panel
22 Inactive Area
23 View Area
24 Image Display Section
25 Protection-from-Light Section
31 Liquid Crystal Television
32 Antenna
33 Tuner
34 Receiving Circuit
35 Synchronous Circuit
36 A/D-Conversion Circuit
37 Controller
38 Signal Side Drive Circuit

39 Scan Side Drive Circuit
41 Data Enabling Generating Circuit
42 Data Enabling H Generating Circuit
43 Data Enabling V Generating Circuit
44 N Bit Counter
45 Decoder
46 47 NAND gate
48 M Bit Counter
49 Decoder
50 51 NAND gate
61 Liquid Crystal Television
62 Memory
63 Indicative-Data Output-Control Section

[Translation done.]

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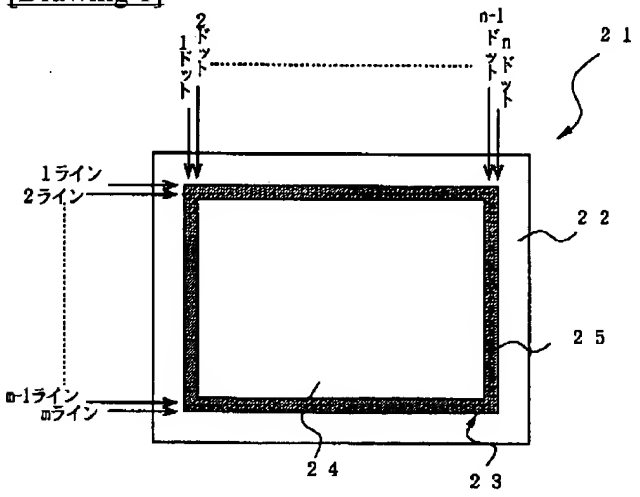
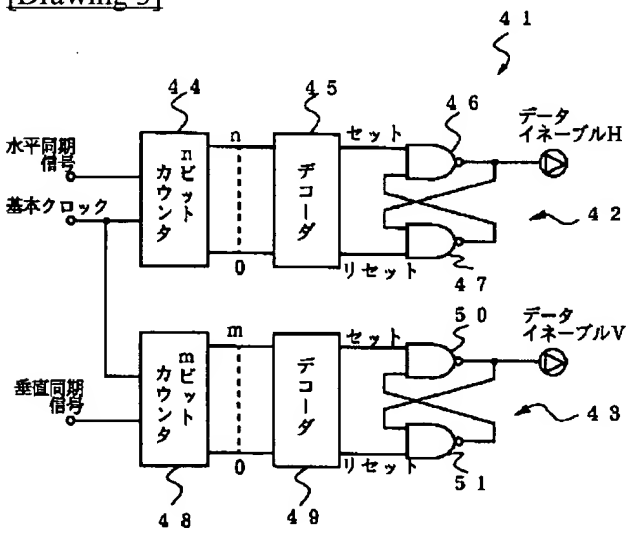
DRAWINGS

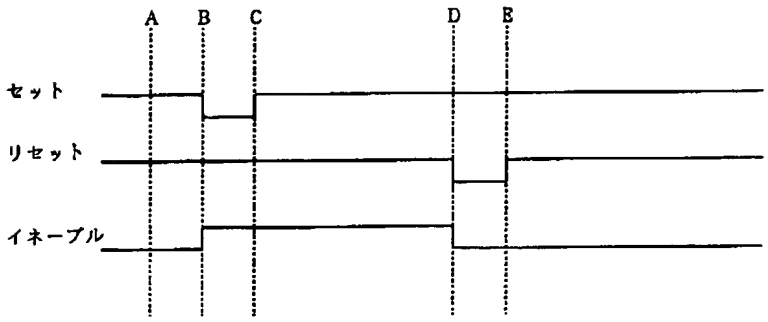
[Drawing 1]



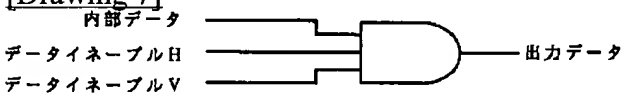
[Drawing 3]



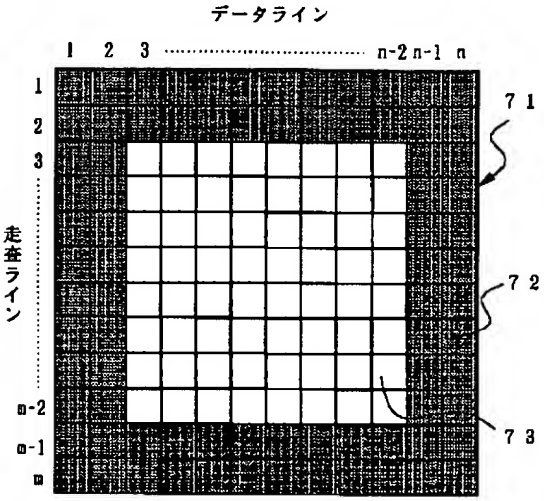
[Drawing 4]



[Drawing 7]



[Drawing 10]



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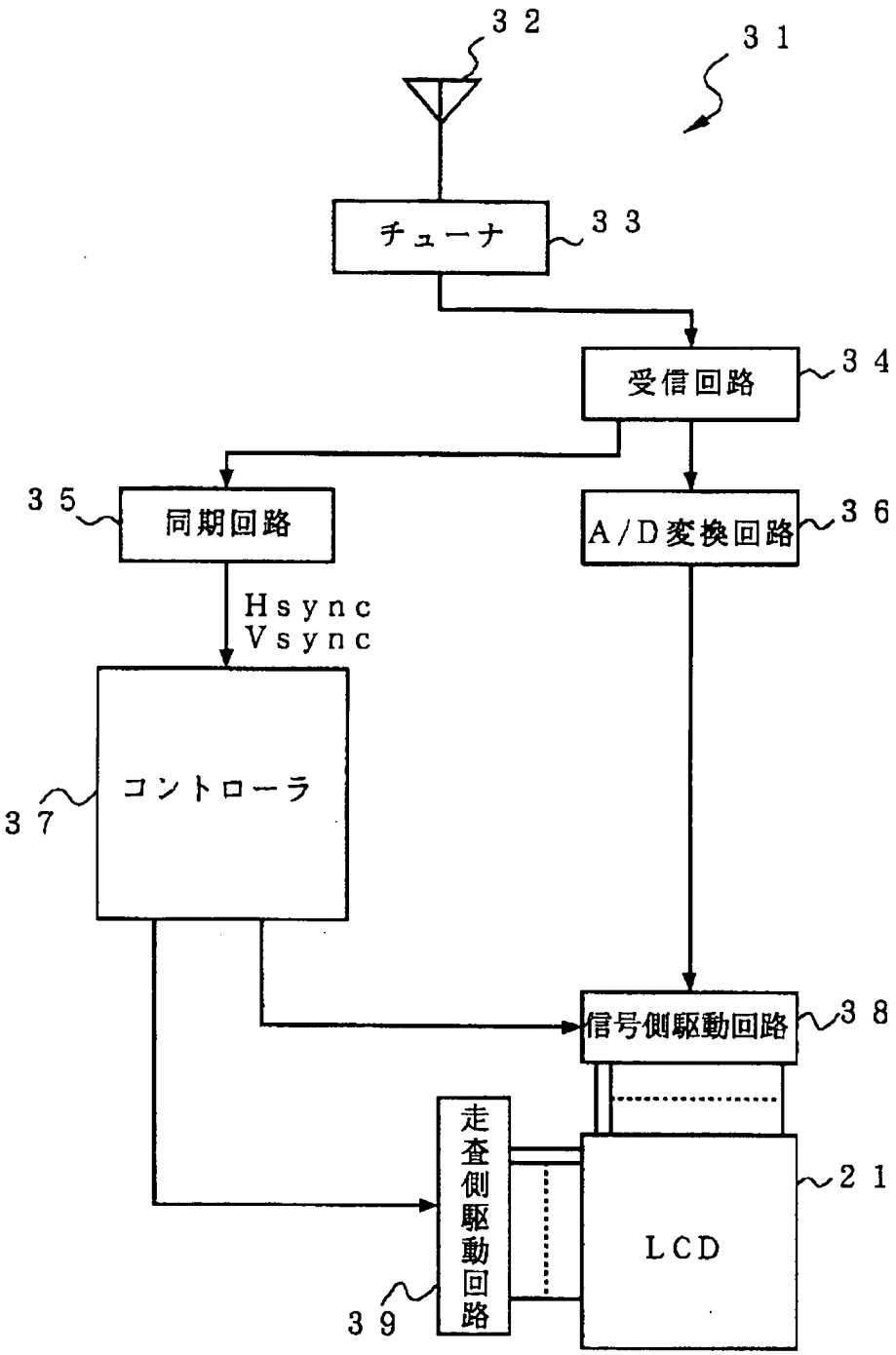
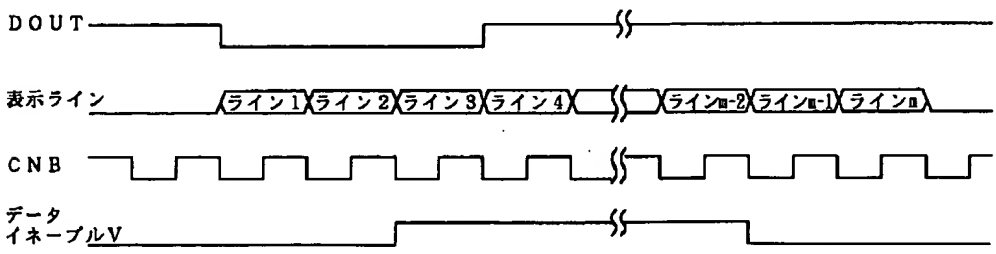
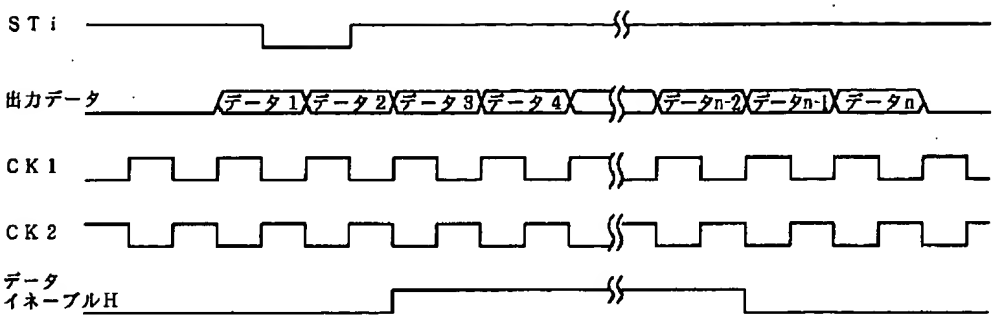


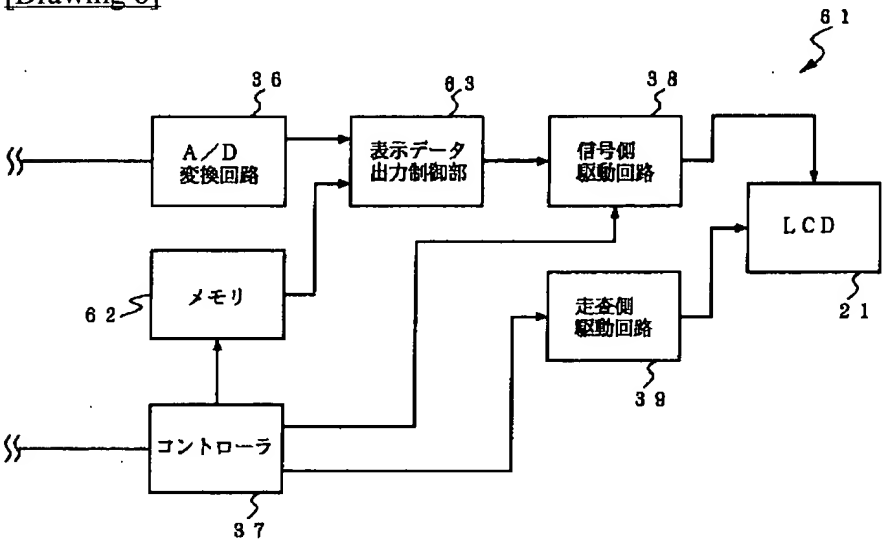
[Drawing 6]



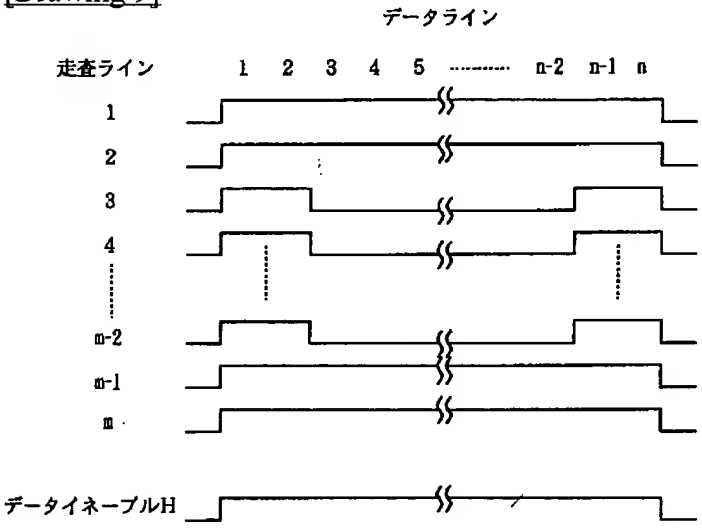
[Drawing 5]



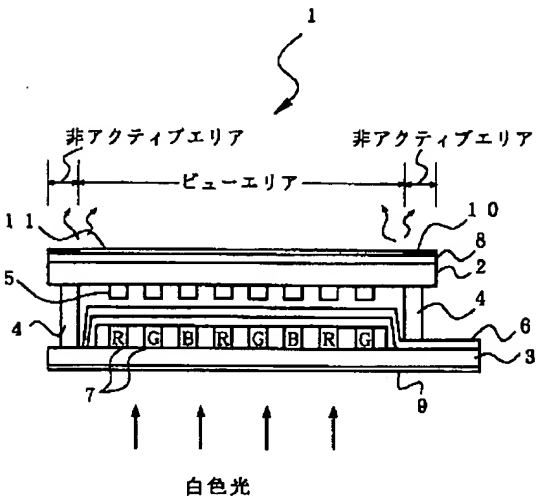
[Drawing 8]



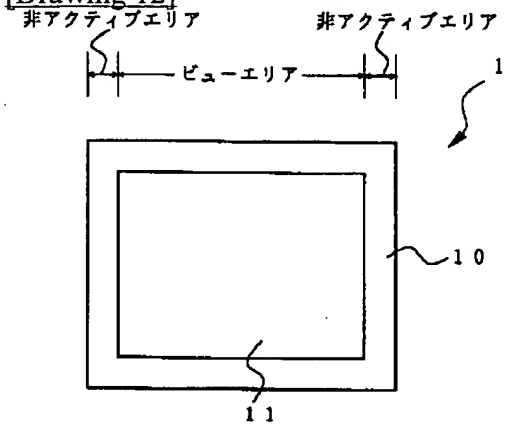
[Drawing 9]



[Drawing 11]



[Drawing 12]



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